Patrick Ford Bridge
(Vermillion County Bridge No. 76)
Spanning the Little Vermilion River on County Road 315 North
Humrick vicinity
Vermillion County, Indiana

HAER No. IN-99



PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Great Lakes System Support Office
Midwest Field Area
Department of the Interior
1709 Jackson Street
Omaha, Nebraska 46102

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# HISTORIC AMERICAN ENGINEERING RECORD

## PATRICK FORD BRIDGE
## (Vermillion County Bridge No. 76)

HAER No. IN-99

Location: Spanning the Little Vermilion River on County Road 315 North, approximately 2.1 km (1.3 miles) northeast of Humrick, Vermillion County, Indiana

UTM: 16.455040.4419490

Quad: Humrick Illinois/Indiana Quadrangle

Date of Construction: ca. July, 1907

Present Owner: Board of Vermillion County Commissioners

Present Use: Vehicular Bridge

Significance: Patrick Ford Bridge (also called Vermillion County Bridge No. 76) is a two span reinforced concrete arch bridge designed by Daniel B. Luten and built by his construction company, the National Concrete Company, Indianapolis, Indiana. Each ring of this 40 meter (131 foot) two span structure, rises 2.84 meters (9 feet 4 inches) for a span length of 16.76 meters (55 feet) and, because it is raised vertically on the pier to increase the waterway area, is unsymmetrical. Few of Luten's bridges are unsymmetrical or have as much rise given the span length. In addition, Mr. Luten also incorporated his patented steel-rod truss for the ring's reinforcement which he in turn tied from the abutment to the pier's base with rods anchored in a concrete floor over the streambed. The Indiana State Historic Preservation Officer (SHPO) has determined that this bridge is of local significance.

Project Information: This document was undertaken in September 1997, in accordance with the Memorandum of Agreement between the Vermillion County Commissioners, the Indiana Department of Transportation, the Advisory Council on Historic Preservation, the Federal Highway Administration, and the Indiana State Historic Preservation Officer as a mitigative measure prior to the demolition of the bridge.

Mr. Erik M. Orstead
Beam, Longest and Neff, Inc.
Consulting Engineers
8126 Castleton Road
Indianapolis, Indiana 46250

Description

Patrick Ford Bridge is a two span reinforced concrete arch bridge designed by Daniel B. Luten and built by his construction company, the National Concrete Company, Indianapolis, Indiana, in 1907. Each ring of this 40 meter (131 foot) two span structure, rises 2.84 meters (9 feet 4 inches) for a span length of 16.76 meters (55 feet) and, because it is raised vertically on the pier to increase the waterway area, is unsymmetrical. Few of Luten's bridges are unsymmetrical or have as much rise given the span length. In addition Mr. Luten also incorporated his patented steel-rod truss for the ring's reinforcement which he in turn tied from the abutment to the pier's base with rods anchored in a concrete floor over the streambed. Solid spandrel walls retain the earth fill which supports the 4.9 meter (16 foot) gravel roadway between paneled parapet walls. The pier has rounded cutwaters, and the abutments are protected by low flared wingwalls.

The existing structure is 40 meters (131 feet) in length and has an out-to-out deck width of 6 meters (19.7 feet). The vertical clearance is unlimited. The existing bridge roadway consists of one gravel lane 5.3 meters (17.4 feet) wide with no sidewalks. The bridge retains its architectural integrity, even including its gravel roadway.

Designer of the Patrick Ford Bridge

The bridge was designed by Daniel B. Luten and built by his construction company, the National Concrete Company, in 1907. Daniel Luten held many patents for special reinforcing systems and different shapes in concrete spans.

Mr. Luten was born in Grand Rapids, Michigan, in 1869. He graduated from the University of Michigan in 1894 with a Bachelor of Science degree in Civil Engineering. He was appointed Instructor of Civil Engineering at the University of Michigan and was the assistant to Professor Charles E. Greene, one of the foremost authorities on arch analysis and author of "Greene's Graphic Method of Truss and Arch Analysis". Mr. Luten resigned his position after one year to become Instructor in Civil Engineering at Purdue University, West Lafayette, Indiana. He was put in full charge of instruction in arch design, stereotomy, and theory of hydraulics. Mr. Luten conducted numerous experiments at Purdue on arches and reinforced concrete and published numerous articles on these researches in Engineering News, Engineering Record and other technical journals.

Mr. Luten resigned from the faculty of Purdue University in 1900, to practice engineering and after one year in general practice, entered actively on the design of reinforced concrete bridges. He was noted for supervising the design and erection of over 4,000 reinforced concrete arches in a ten year period. He had an organized staff of eleven assistant engineers and twenty-four associate engineers located in every part of the United States. Mr. Luten was a member of the Western Society of Engineers, the American Society of Engineering Contractors, and President of the Indiana Engineering Society.

Builder/Fabricator

The National Concrete Company of Indianapolis, Indiana was formed by Mr. Daniel B. Luten ca. 1900, after Mr. Luten left Purdue University. Information gathered indicated that Mr. E.H. Lee was president, Mr. J.P. Cook was Vice President and Alex R. Holiday was Secretary. The National Concrete Company was awarded the contract to build the 40 meter (131 foot), two-span structure in 1907.

History of Patrick Ford Bridge

Southwest of Cayuga and northwest of where the Nickel Plate Railroad crossed the Little Vermilion River was Patrick's Ford, named after Martin Patrick's saw mill and general store that was located there. It was the custom of the time to name a ford after the owner of the adjacent property. The saw mill was built in 1874, and the ford dates back at least that far. Martin Patrick built a house occupied by Omer Wesch until it burned down and had to be rebuilt. A descendant of Omer Wesch still owns the property.

March 25, 1907

Chas. (Charles) Brown and unnamed others presented a petition to the Board of Vermillion County Commissioners for the construction of a new bridge across the Little Vermilion River. The petition did not specify the location of the crossing or why the bridge was required. The County Commissioners were G.B. Tillotson, W. T. Sanders and R. L. Chew. The bridge was deemed necessary and of great public utility by the county commissioners. The county commissioners ordered and appointed Carl H. Conley surveyor and engineer of the bridge. Carl H. Conley was ordered by the county commissioners to prepare and file plans and specifications for the construction of the bridge. In addition, the Board ordered the National Bridge Company of Indianapolis, Indiana to prepare concrete plans and specifications for the construction of the substructure and superstructure and to file them with the Board.

The Board further ordered that the Auditor give notice, as provided by the law, that the bids for the construction and building of the bridge be received up to 10:00 A.M. on Saturday, April 27, 1907.

April 27, 1907

In response to two separate petitions (C.C. Hedges et.al. and Charles Brown et.al.), the Auditor presented seven sealed bids to the Board for the building of two bridges, a bridge in Clinton Township (C.C. Hedges) and for the bridge across the Little Vermilion River (Patrick Ford bridge) in Eugene Township. Having received the bids the Board continued the cause until Monday, May 6, 1907.

May 6, 1907

County Commissioners, G.B. Tillotson, W. T. Sanders and R.L. Chew having carefully examined all bids for the building and construction of the two bridges (C.C. Hedges and Patrick Ford), rejected all the bids and did not let the contracts. The Board ordered Carl H. Conley, Engineer, to prepare in addition to the previously submitted and approved plans, a set of plans and specifications for concrete bridges for the referenced C.C. Hedges and Patrick Ford Bridges.

July 3, 1907

The National Concrete Company of Indianapolis, Indiana with the American Fidelity Company of Montpelier, Vermont filed a "Bond for Construction" for the sum of $27,000.00. This bond was required by law to file a bid for the construction of concrete bridges.

July 6, 1907

The Board awarded the contract for the building and construction of the Patrick Ford Bridge ( and C.C. Hedges bridge) to the National Concrete Company, Indianapolis, Indiana. The bridge would be built according to the plans and specifications for concrete bridges adopted by the Board on July 6, 1907, for the sum of $3,100.00. As specified in the agreement, the two spans were to be 55 feet. The National Concrete Company entered into an agreement on this date to provide all workmanship, labor, implements, machinery, materials, models and molds, cartage, haulage and scaffolding and to do the work required by the plans, specifications and profiles prepared by the

National Concrete Company. In addition, the National Concrete Company agreed to put in place all pilings in the construction of the bridge for a price of $0.50 per linear foot and not to exceed $1,000.00. The agreement further specified that the work should be completed on or before December 20, 1907. If the work was not completed by this date then the National Concrete Company agreed to pay the County the sum of $10.00 per day for each day the bridge remained incomplete.

October 14, 1907

The matter of the approaches to the Patrick Ford Bridge

The Board ordered Mr. Fred Rush, Civil Engineer, to draft plans, profiles and specifications for the approaches to the Patrick Ford Bridge in Eugene Township, Vermillion County, Indiana. Mr. Rush presented to the Board, plans, profiles and specifications for the approaches and the Board, after careful consideration, accepted the approved the plans, profiles and specifications.

In addition, the Board directed the Auditor to give notice, as required by law, that sealed bids would be received for the construction of the approaches up to 10:00 A.M. on November 4, 1907. The Auditor was also directed to give notice of the letting in the Cayuga Herald.

November 4, 1907

Two sealed bids were received by the Board for the construction of the approaches to the Patrick Ford Bridge. The Board noted that the notice of letting was given by publication in the Hoosier State and the Vermillion County News for two weeks successively. The Board found that Mr. Freeman Noggle's bid of 12.5 cents per cubic yard was equal to Mr. Benjamin E. Whitlock's bid. Also, each party filed a good and sufficient bond as provided by law. After careful consideration, G.B. Tillotson, W. T. Sanders and R.L. Chew let the contract for the bridge approaches to Mr. Freeman Noggle and ordered him to appear November 9, 1907 to enter into a contract for the construction of the approaches.

November 9, 1907

On this date Mr. Freeman Noggle entered into an agreement to build and construct both approaches to the Patrick Ford Bridge in strict accordance with the plans, specifications, profiles, bid and bond. Mr. Freeman Noggle also agreed to furnish all the labor and materials for construction of the approaches.

The specifications consisted of constructing earthwork approaches to the bridge extending from approximately 200 feet north of the bridge to approximately 500 feet south or southeast of the bridge. The Board provided earth in borrow pits but the contractor furnished all other labor and materials. The grade was 18 feet wide on top, with side slopes 1.5:1. A clear burm 2 feet wide between the base of the grade and the edge of the borrow was specified. The specifications also stated that the contractor must clear the right-of-way of all obstructions but must leave standing and unhurt tress designated by the engineer to be left for the protection of the grade. In addition, the specification stated that no logs, brush or other unstable material was allowed to be put into the grade.

There is no further recorded history of the Patrick Ford Bridge (Vermillion County Bridge No. 76) over the Little Vermilion River. The county commissioners' meeting minutes were reviewed for several subsequent years and the final entry for this bridge was described for November 9, 1907.

A diligent attempt was made to determine the historical significance of Patrick Ford Bridge. A detailed listing of the references which were researched has been provided.

## BIBLIOGRAPHY

1. Comp, T. Allen, Bridge Truss Types: A Guide to Dating and Identifying. 1977

2. HABS/HAER inventory survey card provided by the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology. 1986

3. National Concrete Company. The Luten Truss: Indianapolis, Indiana: National Concrete Company, 32p. 1900

4. National Concrete Company of Indianapolis. West Washington Bridge over White River. 1916

5. O'Donnell, Harold L.. Eugene Township, Vermillion County, Indiana. The First 100 Years, 1824-1924. Cayuga, Indiana. Interstate Printers and Publishers, Danville, Il.

6. Pope, Thomas. A Treatise on Bridge Architecture. New York: Shaw and Shoemaker. 1811

7. Reinforced Concrete Bridges of Luten Design. Indianapolis, Hollenback Press, n.d. 45 p.

8. Vermillion County Board of County Commissioners' Meeting Minutes/Auditors Records from January 1907 to September 1908 which are prepared and maintained in the Vermillion County Auditor's Office.

## LIBRARIES

1. Indiana Historical Society Library, William Henry Smith Memorial Library
   West Ohio Street, Indianapolis, Indiana 46202

   Topics reviewed included County History, James L. Cooper, Ph.D., Daniel B. Luten, Concrete Bridge Engineer, National Concrete Company, Bridge, Patrick Ford Bridge, Luten Truss, Concrete, Stell Rod Truss, Unsymmetrical, Reinforced Structures, Little Vermilion River, Comprehensive Inventory.

2. Newport Public Library
   Box 97
   Newport, Indiana

3. Indiana State Library
   West Ohio Street
   Indianapolis, Indiana 46202

## ORGANIZATIONS AND INSTITUTIONS

Vermillion County Historical Society Auditors Office
Vermillion County Courthouse
NewPorte, Indiana 47966

Vermillion County Courthouse
NewPorte, Indiana 47966

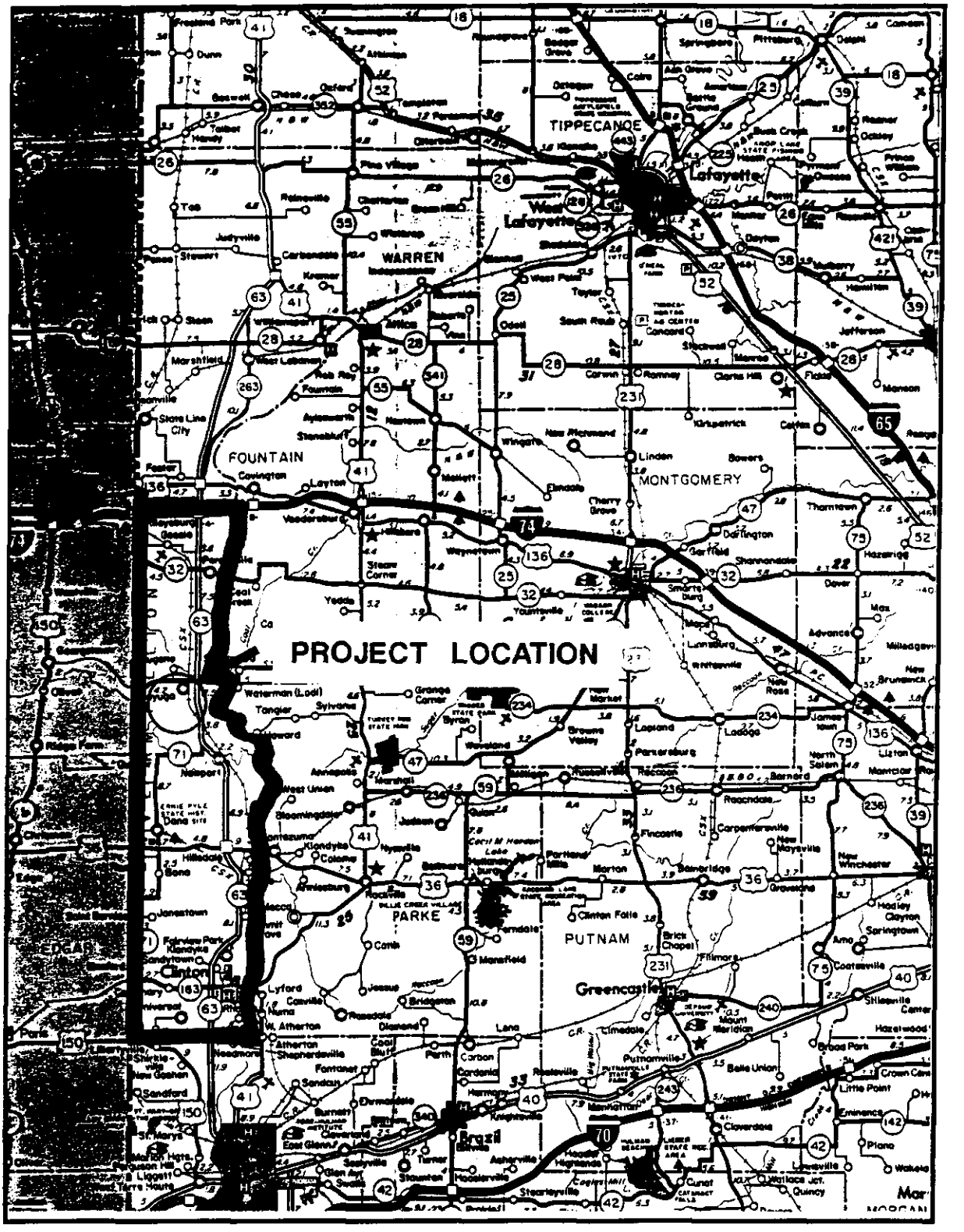
Ms. Debbie Buress
Vermillion County Surveyors Office Vermillion County Courthouse
NewPorte, Indiana 47966

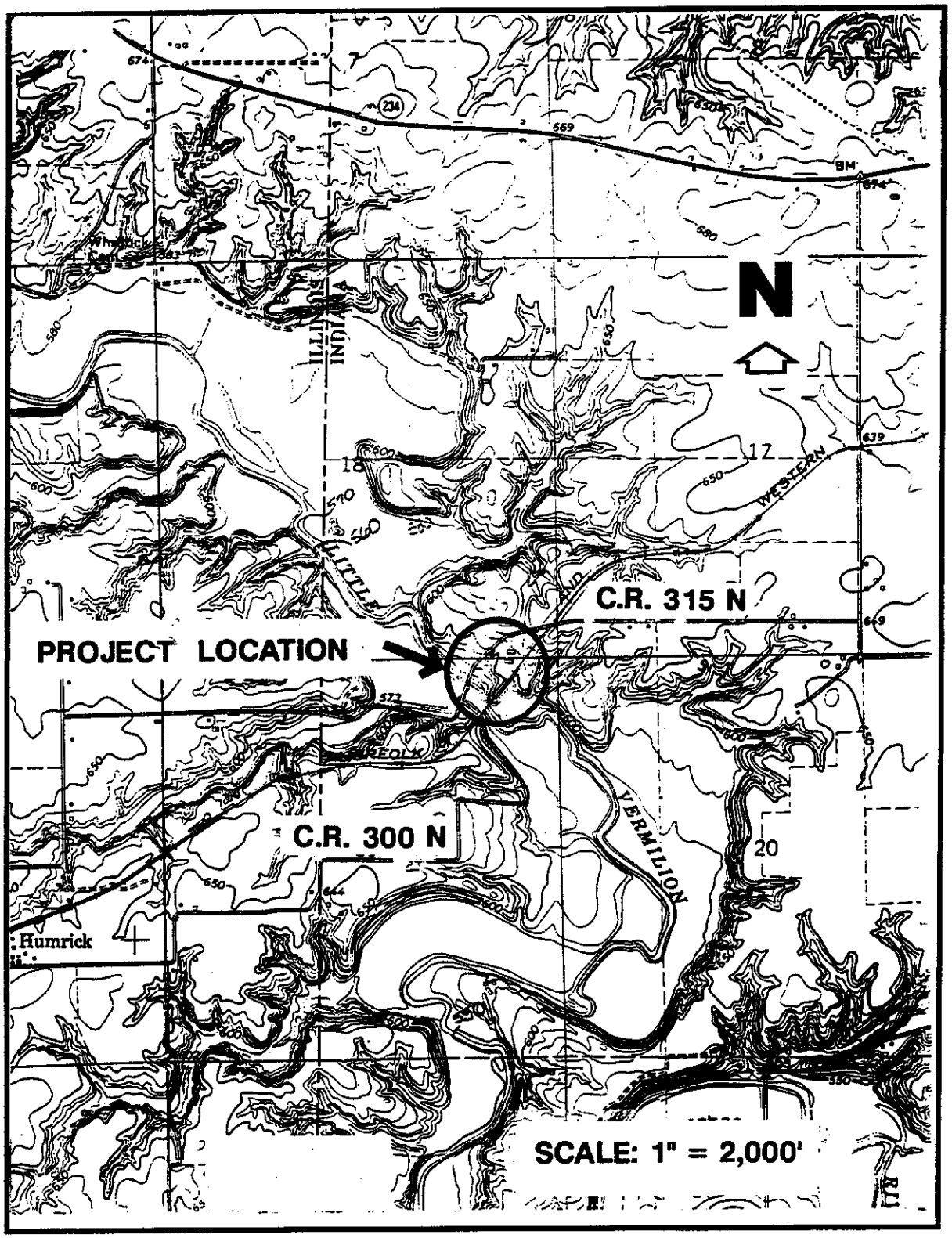
Ms. Susan Sutton
Indiana Historical Society
315 West Ohio Street
Indianapolis, Indiana 46202

Professor James Cooper, Ph.D.
Historic Department
Depauw University
Greencastle, Indiana 46202

Mr. Patrick Ralston
State Historic Preservation Officer
Division of Historic Preservation and Archaeology
Indiana Department of Natural Resources
402 West Washington Street, Room 274
Indianapolis, Indiana 46204

C. Russel Stanford, Director
Anthropology Lab
Indiana State University
Terre Haute, Indiana 47809


PROJECT LOCATION
TIPPECANOE
Lafayette
West Lafayette
WARREN
FOUNTAIN
MONTGOMERY
PARKE
PUTNAM
Greencastle
Clinton
Brazil


N
C.R. 315 N
PROJECT LOCATION
C.R. 300 N
Humrick
WESTERN
VERMILLION
LITTLE
20
17
18
SCALE: 1" = 2,000'